

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

GODO KAISHA IP BRIDGE 1,	§	
Plaintiff,	§	
v.	§	Case No. 2:21-CV-213-JRG (Lead Case)
TELEFONAKTIEBOLAGET LM ERICSSON and ERICSSON INC.,	§	JURY TRIAL DEMANDED
Defendants.	§	
GODO KAISHA IP BRIDGE 1,	§	
Plaintiff,	§	
v.	§	Case No. 2:21-CV-215-JRG (Member Case)
NOKIA CORPORATION, NOKIA SOLUTIONS AND NETWORKS OY, and NOKIA OF AMERICA CORPORATION,	§	JURY TRIAL DEMANDED
Defendants.	§	

GODO KAISHA IP BRIDGE 1'S
OPENING CLAIM CONSTRUCTION BRIEF

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. THE PROPER CONSTRUCTION OF DISPUTED TERMS	2
A. Applicable Law	2
B. U.S. Patent No. 7,372,909.....	2
1. Background.....	2
2. “an OFDM multicarrier signal comprising a first plurality of subcarriers and a second plurality of subcarriers” (claims 1, 5).....	3
C. U.S. Patent No. 8,077,594.....	7
1. Background.....	7
2. “guard time during which nothing is transmitted” (claims 1, 13).....	8
3. “subframe” (claims 1, 13).....	12
D. U.S. Patent No. 8,085,724.....	13
1. Background.....	13
2. “a plurality of sequences, which are indexed by the indices having consecutive numbers in order of generally increasing to a maximum value and then decreasing, from the maximum value, a required cyclic shift amount according to a sequence number” (claims 12, 18)	15
3. “the required cyclic shift amount is a required cyclic shift amount for a mobile station moving at high speed” (claim 13).....	22
E. U.S. Patent No. 8,385,239.....	22
1. Background.....	22
2. “the aperiodic channel quality indicator report is multiplexed with data transmitted by the mobile terminal”/ “the aperiodic channel quality indicator report is not multiplexed with data transmitted by the mobile terminal” (claim 14).....	23
F. U.S. Patent No. 9,137,000.....	26
1. Background.....	26
2. “subcarrier block” (claims 1, 11)	26
III. CONCLUSION.....	28

TABLE OF AUTHORITIES

	Page
Cases	
<i>Altiris, Inc. v. Symantec Corp.</i> , 318 F.3d 1363 (Fed. Cir. 2003).....	21, 22, 27
<i>Astrazeneca AB v. Mut. Pharm. Co.</i> , 384 F.3d 1333 (Fed. Cir. 2004).....	25
<i>Bancorp Servs., L.L.C. v. Hartford Life Ins. Co.</i> , 359 F.3d 1367 (Fed. Cir. 2004).....	27
<i>Blackbird Tech LLC v. ELB Elecs., Inc.</i> , 895 F.3d 1374 (Fed. Cir. 2018).....	28
<i>Embrex, Inc. v. Serv. Eng'g Corp.</i> , 216 F.3d 1343 (Fed. Cir. 2000).....	11, 18
<i>Epos Techs. Ltd. v. Pegasus Techs. Ltd.</i> , 766 F.3d 1338 (Fed. Cir. 2014).....	28
<i>Godo Kaisha IP Bridge 1 v. TCL Commc'n Tech. Holdings Ltd.</i> , 249 F. Supp. 3d 767 (D. Del. 2017).....	23
<i>Honeywell Int'l, Inc. v. ITT Indus., Inc.</i> , 452 F.3d 1312 (Fed. Cir. 2006).....	24
<i>Interval Licensing LLC v. AOL, Inc.</i> , 766 F.3d 1364 (Fed. Cir. 2014).....	19
<i>Luminara Worldwide, LLC v. Liown Elecs. Co.</i> , 814 F.3d 1343 (Fed. Cir. 2016).....	3
<i>Nautilus, Inc. v. Biosig Inst., Inc.</i> , 134 S.Ct. 2120 (2014).....	2
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005).....	2, 6, 20
<i>Regents of the Univ. of Minn. v. AGA Med. Corp.</i> , 717 F.3d 929 (Fed. Cir. 2013).....	24
<i>SIMO Holdings v. H.K. Ucloudlink Network Tech.</i> , 983 F.3d 1367 (Fed. Cir. 2021).....	16

<i>Thomas v. Bryant,</i> 919 F.3d 298 (5th Cir. 2019)	16
<i>Thorner v. Sony Comput. Entm't Am. LLC,</i> 669 F.3d 1362 (Fed. Cir. 2012).....	2, 3, 12, 27
<i>TIP Systems, LLC v. Phillips & Brooks/Gladwin, Inc.,</i> 529 F.3d 1364 (Fed. Cir. 2008).....	11
<i>Verizon Servs. Corp. v. Vonage Holdings Corp.,</i> 503 F.3d 1295 (Fed. Cir. 2007).....	24
<i>Williamson v. Citrix Online, LLC,</i> 792 F.3d 1339 (Fed. Cir. 2015).....	13

I. INTRODUCTION

IP Bridge respectfully submits this Opening Claim Construction Brief for U.S. Patent Nos. 7,372,909 (“the ’909 patent”); 8,077,594 (“the ’594 patent”); 8,085,724 (“the ’724 patent”); 8,385,239 (“the ’239 patent”); and 9,137,000 (“the ’000 patent”).

IP Bridge’s proposed constructions are consistent with the intrinsic evidence, including the language of the claims as read in light of the asserted patents’ respective specifications and prosecution histories, and they are consistent with the understanding of a person of ordinary skill in the art (“POSITA”). As discussed below, IP Bridge’s constructions are correct, will assist the jury, and should be adopted.

Defendants’ proposed constructions, in contrast, contradict numerous fundamental principles of claim construction and should be rejected. First, Defendants propose constructions for several terms that have plain meaning, even though nothing in the intrinsic record suggests that the applicant intended these terms to have a different meaning. In doing so, Defendants violate the well-established principle that the words of a claim are given their plain meaning except when there is (1) lexicography or (2) clear disavowal of claim scope. Second, Defendants ignore descriptions of “the present invention” in the patents to attempt to capture subject matter outside of the claims. This contravenes the well-established principle that a patentee’s description of “the present invention” limits the scope of the invention, and thus limits claim scope. Third, Defendants propose constructions that contradict the express language of the claims. This violates the age-old principle that claim construction is intended to clarify the meaning of claim terms, not change their meaning. And fourth, Defendants assert that multiple claim limitations are indefinite, even though the only evidence of whether the claims would inform, with reasonable certainty, those skilled in the art about the scope of the invention shows that the claims are not indefinite. This violates the Supreme Court’s holding in *Nautilus, Inc. v.*

Biosig Inst., Inc. that the proper test for whether a claim is invalid for indefiniteness is whether the claim, “read in light of the specification delineating the patent, and the prosecution history, fail[s] to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” 134 S.Ct. 2120, 2124 (2014).

II. THE PROPER CONSTRUCTION OF DISPUTED TERMS

A. Applicable Law

Claim terms should be construed consistent with their “ordinary and customary meaning,” which is “the meaning that the term[s] would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005). Where a patentee does not redefine a term or clearly disavow its scope, the plain and ordinary meaning should govern. *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

B. U.S. Patent No. 7,372,909

1. Background

The ’909 patent is generally directed to an OFDM (“orthogonal frequency division multiplexed”) multicarrier communications scheme that allows switching rapidly between the control channel and a data channel to improve the speed and efficiency of the system. These channels are transmitted using subcarriers, which are units of frequencies used to communicate in an OFDM system. Instead of the conventional approach of a base station transmitting subcarriers of a data channel and subcarriers of a control channel with different center frequencies, the ’909 patent provides an improved, specific way for transmitting data-channel and control-channel subcarriers with a single, common center frequency. *See, e.g.*, ’909 patent, 1:61-2:8.

2. “an OFDM multicarrier signal comprising a first plurality of subcarriers and a second plurality of subcarriers” (claims 1, 5)

IP Bridge’s Construction	Defendants’ Construction
This portion of the preamble is limiting, and should be construed as: “an orthogonal frequency division multiplexed multicarrier signal comprising a first plurality of subcarriers and a second plurality of subcarriers”	The disputed preamble language is limiting, and should be construed as “an orthogonal frequency division multiplexed multicarrier signal that is not time division multiplexed comprising a first plurality of subcarriers and a second plurality of subcarriers”

The parties agree that the identified portion of the preamble is limiting, and that “OFDM” means “orthogonal frequency division multiplexed.” The parties’ only dispute is whether this limiting preamble language should be construed to include a negative limitation that the claimed OFDM multicarrier signal “is not time division multiplexed” (“TDM”).

Defendants argue incorrectly that TDM should be excluded from the scope of the claims based on Applicant’s statements during prosecution regarding U.S. Patent No. 6,522,638 (“Haugli”). Absent clear and unambiguous disavowal of claim scope, plain meaning applies. *See, e.g., Thorner*, 669 F.3d at 1365. None of Applicant’s arguments relating to the Haugli reference clearly state (or even suggest) that a signal generated through a combination of OFDM and TDM methods was not covered by the claims. Rather, as explained below, Applicant simply made the unremarkable observation that Haugli taught TDM, *not* OFDM, and thus did not meet the express “OFDM” requirement of the claims. This comes nowhere close to a “clear and unmistakable” disavowal excluding from the claim scope a combination of TDM and OFDM.

See Luminara Worldwide, LLC v. Liown Elecs. Co., 814 F.3d 1343, 1353 (Fed. Cir. 2016) (“The standards for finding [] disavowal are exacting. . . . [D]isavowal requires that the specification [or prosecution history] make[] clear that the invention does not include a particular feature. While

such disavowal can occur either explicitly or implicitly, it must be clear and unmistakable.”)
(internal citations omitted).

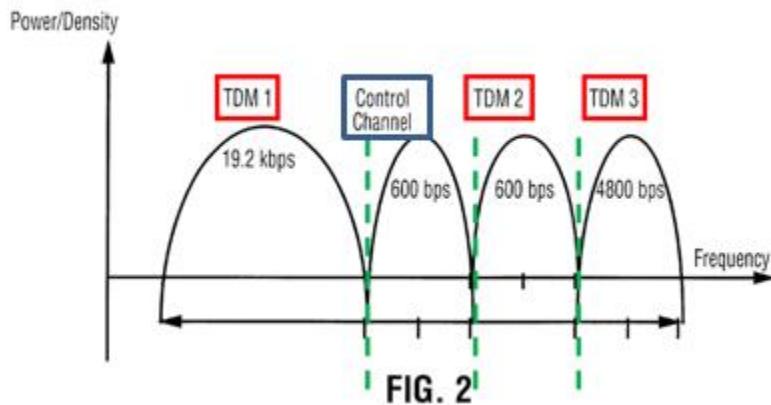
As an initial matter, there can be no dispute that OFDM and TDM can be used together in a single system. Defendants admitted as much in an IPR petition challenging this patent, when they acknowledged that a POSITA would have understood that TDM and OFDM can be used together in the same system, contrary to Defendants’ narrowing construction here. *See Ex. I, p.23.* (“*POSITA would also have understood that OFDM and TDM are different multiplexing techniques that can be used independently of each other (*either individually or in combination*).*”).¹ Additionally, contemporaneous art confirms that OFDM and TDM signals can coexist in the same system. *See, e.g., Ex. J, p.1* (“In this paper, the multicarrier transmission technique (***OFDM***) is considered in combination with a TDMA/TDD multiple access scheme for a cellular mobile communication system”).

During prosecution, Applicant made arguments consistent with the plain meaning of OFDM, relying on the fact that the Haugli reference did not disclose OFDM of any sort (whether used with TDM or not). Notably, the Examiner never asserted that Haugli teaches OFDM. Instead, the Examiner raised Haugli in a rejection of the original ’909 claims, which did not recite OFDM. In response, Applicant canceled all then-pending claims and drafted substantially new claims directed to an “***OFDM*** multicarrier signal.”²

¹ All emphasis added unless otherwise indicated.

² Applicant drafted new claims in its Oct. 29, 2007 Amendment and Response (Ex. K, IPB213_0000488-497), but numbered those new claims incorrectly (Ex. K, IPB213_0000508-510). Citations herein are made to the corrected amendment dated Dec. 6, 2007. Ex. K, IPB213_0000511-521.

Applicant pointed out that Haugli teaches TDM, *not* OFDM as required by the new claims. In particular, Applicant described Haugli's Figure 2 as disclosing "**TDM transmission**" in which a single control channel is located between data channels on a frequency axis in a frequency domain ... with the control channel being centered in the center of the receiving band." Ex. K, IPB213_0000494-495, 518-519. Haugli's Figure 2, shown below, includes three "TDM" transmissions (TDM 1, TDM 2, TDM 3 shown in red annotations below) with a control channel (blue annotation below) between the TDM 1 channel at one frequency and the TDM 2/TDM 3 channels at other frequencies:



Ex. L, Haugli, FIG. 2 (annotated).

Importantly, Haugli's Figure 2 does not show an OFDM transmission because the channels at different frequencies are sent at different times (since TDM 1, 2, 3 are on different TDM channels), and thus are not sent simultaneously, as OFDM requires. *See* Ex. M, 33 ("The basic principle of OFDM is to split a high-rate datastream into a number of lower rate streams that are **transmitted simultaneously over a number of subcarriers**."). Thus, Applicant distinguished Haugli because it failed to disclose OFDM. In so doing, Applicant did not make any statement that would exclude from claim scope an OFDM signal that used TDM, as Defendants attempt to do now.

The opinion of Defendants' expert, Dr. Mahon, does not establish otherwise. First, Dr. Mahon ignores that the transmissions in Haugli's Figure 2 are sent at different times by ignoring the "TDM 1," "TDM 2," and "TDM 3" transmission labels. By ignoring these labels, Dr. Mahon incorrectly argues that the three signals are sent simultaneously. Dr. Mahon's failure to address this aspect of Haugli's Figure 2 renders his entire analysis unreliable. *See Phillips*, 415 F.3d at 1318 ("[A] court should discount any expert testimony that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent.") (citation omitted). Moreover, as Dr. Mahon acknowledges, even if those transmissions were simultaneous, the resulting system in Haugli would be multiplexed by frequency (FDM), not *orthogonally* multiplexed by frequency (OFDM). *See, e.g.*, Mahon, ¶¶41 ("the examiner found that Haugli taught a **frequency** division multiplexed signal"), 43 ("data **channels are multiplexed in frequency** and also multiplexed in time"). Dr. Mahon's opinion is consistent with how a POSITA would have understood that Haugli discloses, at best, FDM and TDM, but indisputably does not disclose OFDM, which the then-pending claims required. For example, it was understood that an FDM signal (or conventional multicarrier technique) has multicarrier signals that do not overlap (Figure 1.10(a) below), and an OFDM signal (bottom) has overlapping multicarrier signals (figure 1.10(b) below):

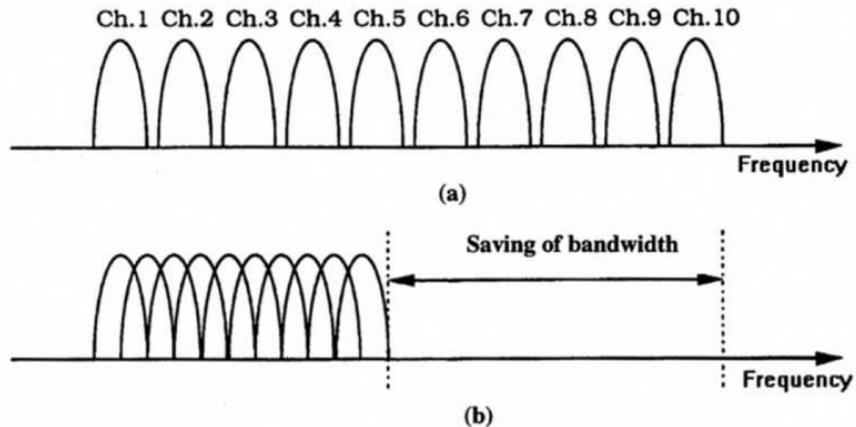


Figure 1.10 Concept of OFDM signal: (a) Conventional multicarrier technique, and (b) orthogonal multicarrier modulation technique.

Ex. M, 22. Dr. Mahon's acknowledgement that the nonoverlapping signals in Haugli are FDM is consistent with this basic principle. Consistent with this, Applicant relied on Figure 4 of the '909 (showing overlapping subcarrier) as showing an OFDM signal. *See* Ex. K, IPB213_0000517, 519.

In short, Applicant distinguished Haugli on the ground that it did not disclose OFDM, as claimed—Applicant never argued that the claims did not cover a system that used OFDM with TDM. Because Applicant did not clearly and unambiguously disavow the use of OFDM with TDM, and instead merely described the Haugli prior art consistent with the plain meaning of terms, Defendants' narrowing, negative construction should be rejected.

C. U.S. Patent No. 8,077,594

1. Background

The '594 patent is generally directed to a method and base station apparatus for reducing interference when receiving a random access preamble and a Sounding Reference Signal (SRS). For an unsynchronized mobile device (i.e., one that is not connected to a base station) to connect to a particular base station, the mobile device must transmit a random access preamble to the base station. Wells, ¶26. But because the mobile device is some unknown distance from that

base station, the time it will take the preamble to reach the base station is not known, and thus the preamble's arrival at the base station will be delayed by an unknown time. *Id.*, ¶¶ 27-29. To account for this unknown delay, the mobile device adds to the preamble a “guard time” during which the mobile device does not transmit information, thus creating a buffer that ensures that the preamble itself is received within a single subframe and without interference. *Id.*, ¶30-31; '594 patent, 1:39-44, 2:15-19.

Separate from the preamble, an SRS is a signal that is used to measure channel quality. *Id.*, ¶32. The '594 patent explains that a problem exists whereby interference may occur between synchronized mobile devices (i.e., ones that are connected to a base station) transmitting SRSs and unsynchronized devices transmitting random access pREAMbles. *Id.*, ¶33; '594 patent, 7:17-22. To minimize this interference, the '594 patent discloses that synchronized mobile devices can transmit SRSs during the guard time following the preamble. Wells, ¶33; '594 patent, 5:50-55, 7:17-22. An illustration of the timing of the SRS relative to the random access preamble is shown below:

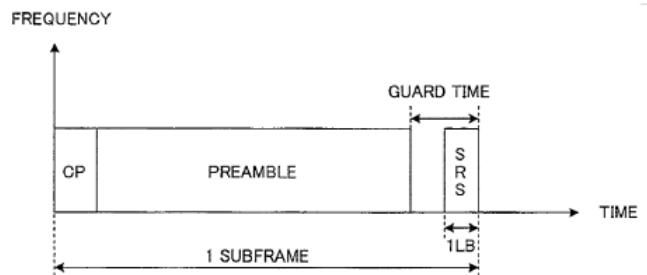


FIG.5

Wells, ¶42; '594 patent, Fig. 5.

2. “guard time during which nothing is transmitted” (claims 1, 13)

IP Bridge's Construction	Defendants' Construction
“the guard time during which nothing is transmitted by the device transmitting the random access preamble”	“the guard time during which nothing except the SRS is transmitted”

IP Bridge’s proposed construction makes clear that the phrase “during which nothing is transmitted” references the device transmitting the random access preamble. This is consistent with the claim language, the specification, and the file history of the ’594 patent. In contrast, defendants seek to rewrite the limitation in a manner that contradicts the construed phrase “during which **nothing** is transmitted” by allowing **something** to be transmitted by the mobile device that sends the preamble.

IP Bridge’s construction is consistent with the claim language. Both claims 1 and 13 include the following limitation: “guard time during which nothing is transmitted being added to the last of the random access preamble.” *Id.*, claim 1, 13. Because the guard time is being added to the last of the preamble, the express claim language requires the device that transmits the preamble to be the *same* device that adds the guard time to the last of the preamble. Wells, ¶36. Thus, it is the device transmitting the preamble that is responsible for ensuring that the guard time is a period during which nothing is transmitted. It is of no moment to this device what other devices in the cell are transmitting.

This understanding of the claim is consistent with the specification, which explains that an unsynchronized mobile device (mobile device 200) sends the random access preamble, whereas a synchronized mobile device (mobile device 300) sends the SRS. Wells, ¶¶35, 37-42. In particular, the specification explains that “[b]ase station 100 **receives a preamble from mobile station 200 (FIG. 2) . . . and receives an SRS from mobile station 300 (FIG. 3) . . .” ’594 patent, 3:42-45. The specification goes on to confirm that “the preamble and the SRS shown in**

FIG. 5 are transmitted from *different* mobile stations, mobile station 200 (FIG. 2) and mobile station 300 (FIG. 3).” *Id.*, 7:3-5. Further, in reference to Figure 2, the specification describes that the unsynchronized mobile station 200 sending the random access preamble includes “[g]uard time adding section 206,” which “adds a guard time of a predetermined time length to the preamble inputted from preamble generation section 205.” ’594 patent, 5:9-11; 9:47-52. Then, in reference to figure 3, the specification discloses that the synchronized mobile station 300 includes “arrangement section 307,” which “arranges for the SRS in the guard time position in the preamble” and transmits the SRS. *Id.*, 5:53-55. Thus, the unsynchronized device sending the random access preamble adds the guard time and then does not transmit anything during the guard time, whereas the synchronized device transmits the SRS within the known guard time interval. Wells, ¶¶38–41.

The file history further confirms that it is the device transmitting the preamble that transmits nothing during the guard-time interval. During prosecution, the phrase “during which nothing is transmitted” was added to the claims, and the Applicant stated that Figure 5 provided support for this amendment. *See* Ex. N, IPB213_0000739. As noted above, the ’594 patent explains that Figure 5 shows that the preamble and SRS “are transmitted from different mobile stations.” ’594 patent, 7:3-5. Applicant then explained that the purpose of the “guard time during which nothing is transmitted” is to “eliminate interference between a synchronized signal and a non-synchronized signal in reception timing.” *Id.* This stated goal of eliminating interference between the preamble and the SRS is accomplished because the SRS and preamble are transmitted at different times by different devices, and thus the device transmitting the preamble must not transmit during the time when the SRS is transmitted by the other device. Wells, ¶¶43, 44.

Rather than clarify what the disputed limitation means by giving meaning to “during which nothing is transmitted,” Defendants instead rewrite the claims such that “nothing is transmitted” actually means that something (i.e., the SRS) *is* transmitted. Because defendants’ construction changes the meaning of the claim, rendering it nonsensical, it should be rejected. *Embrex, Inc. v. Serv. Eng’g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000) (“[T]he construction of claims is simply a way of elaborating the normally terse claim language[] in order to understand and explain, but not to change, the scope of the claims.”) (citations and internal quotations omitted).

Defendants’ only purported support for their construction is their assertion that the ’594 patent discloses an embodiment in which a single mobile device transmits both a preamble and an SRS. Lanning, ¶65. But “*the claims of the patent need not encompass all disclosed embodiments.*” *TIP Systems, LLC v. Phillips & Brooks/Gladwin, Inc.*, 529 F.3d 1364, 1373 (Fed. Cir. 2008). The embodiment that Mr. Lanning points to explains that, in contrast to the other embodiments in the patent, “the mobile station may arrange an SRS in a guard time of a preamble.” ’594 patent, 13:14-24. Nowhere in discussing this embodiment does the patent refer to this guard time as one “during which nothing is transmitted”—because the device’s SRS *is* transmitted during that guard time. *Id.* On the other hand, as noted above, Applicant narrowed the scope of claims during prosecution to not include every type of “guard time,” but to specifically recite only a guard time “during which nothing is transmitted.” Ex. N, IPB213_0000739.

The court should reject Defendants’ construction because it rewrites the claim to mean the opposite of what the disputed claim requires. IP Bridge’s construction, on the other hand, makes clear for the jury that the device that adds the guard time to the preamble dues not

transmit anything during that guard time, as the claim states and as the specification and prosecution history explain.

3. “subframe” (claims 1, 13)

IP Bridge’s Construction	Defendants’ Construction
Plain and ordinary meaning	“a 1 millisecond time period in a frame”

The term “subframe” is understood by a person of skill in the art without further construction. Thus, the plain meaning should apply.

There can be no dispute that “subframe” was a term of art at the time of filing of the ’594 patent, and that a POSITA would have understood the meaning of this term in wireless communications systems. Lanning, ¶¶53, 55 (Defendants’ expert admitting that the term “subframe” was used in the prior art). Moreover, there can be no dispute that known subframes were not restricted to any particular time length. *Id.* (Mr. Lanning admitting that known wireless WCDMA systems used 2 millisecond subframes, while known wireless LTE systems used 1 millisecond subframes). Thus, Defendants’ proposed construction limiting the subframe to 1 millisecond could be correct through only lexicography or clear disavowal of claim scope.

Thorner, 669 F.3d at 1365. Neither applies here.

Defendants’ only attempted support consists of *examples* of 1 millisecond (ms) subframes in the context of specific prior art systems. Lanning, ¶54. The full context of these statements makes clear that none of these examples limits the definition of “subframe” to a 1 millisecond time period, as Defendants suggest:

- “**According to the 3GPP RAN LTE, for example**, an SRS is formed . . . the mobile station transmits SRSs periodically (*e.g.* at 1-subframe intervals—at 1 ms intervals)” (’594 patent, 1:22-26);
- “**According to the 3GPP RAN LTE**, the preamble is formed . . . the mobile station transmits preambles periodically (*e.g.* at 10-subframe intervals=10 ms intervals)” (*Id.*, 1:55-56);

- “When transmitting an SRS, resources of the time domain and frequency domain may be assigned thereto exclusive of other signals (*e.g. see Non-Patent Document 3*). Here, an SRS is assigned to the first 1 LB in one subframe (=1 ms)” (*Id.*, 2:4-7).

Presenting *examples* where the subframe is 1 millisecond does not disavow subframes of other lengths. *See Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1346–47 (Fed. Cir. 2015) (“This court has repeatedly ‘cautioned against limiting the claimed invention to preferred embodiments or specific examples in the specification.’”) (quoting *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1328 (Fed. Cir. 2002)).

D. U.S. Patent No. 8,085,724

1. Background

The ’724 patent is generally directed to a method and apparatus for allocating preambles used in a random access procedure to establish a connection between a base station and a terminal (i.e., a phone, mobile station, or “user equipment”). ’724 patent, Abstract, 1:13-60; Akl, ¶33. As noted above in the background discussion of the ’594 patent, as part of this process, the mobile station transmits a random access preamble to the base station to allow the base station to detect that mobile station. Each preamble should be distinguishable from other preambles so that a base station can separately detect different preambles transmitted from different mobile stations. Akl, ¶33. One way to create different preambles is by “cyclically shifting” a known sequence. ’724 patent, 12:57-63; Akl, ¶¶33-36. There are minimum and maximum cyclic shifts, however, that can be used to generate a set of preambles from a given sequence.

The minimum cyclic shift that can be used within a cell (i.e., the area served by a base station) is determined by the size of that cell. Akl, ¶¶37-38. The larger the cell, the larger the necessary minimum cyclic shift to ensure the base station can distinguish between transmissions by different mobile stations. *Id.* This is because transmissions from the periphery of the cell take longer to arrive at the base station compared to transmissions sent by mobile stations closer

to the base station. This delay in reception of the preamble can cause it to overlap with (and appear indistinguishable from) a cyclically shifted preamble transmitted by a device close to the base station. *Id.* Thus, in order for a cellular communication system to operate properly, a base station sets a required cyclic shift, which is greater than or equal to the minimum cyclic shift that depends on the cell size. *Id.*; '724 patent, 19:26-27.

On the other hand, a maximum applicable cyclic shift is necessary for each individual preamble code because of distortions that occur when a mobile device is moving at high speed. Akl, ¶¶39-40. When a mobile device moves at high speed and transmits pREAMbles to a base station, the high speed of the mobile device causes distorted copies of the preamble appear to the base station as if they are cyclically shifted copies of its sequence. *Id.* Notably, the position of the distorted copy varies depending on the code that is used for the preamble. *Id.* If a distorted copy of a code arrives at the base station at the same time as an actual cyclically shifted copy of the code sent by another device, the base station will be unable to distinguish between the transmissions from two devices. Thus, for a given code, there is a maximum applicable shift that can be used to generate pREAMbles. '724 patent, 17:62-18:5.

Because there is a maximum applicable cyclic shift that can be used for a sequence, but each cell has a minimum required cyclic shift based on the cell size, there is a restriction on which sequences can be used according to the required cyclic shift for a given cell size. Akl, ¶41. The inventors of the '724 patent recognized that, in order to efficiently allocate pREAMbles used by mobile stations within a cell, it is possible to arrange base sequences and available cyclic shifts that can be used to generate pREAMbles in a manner known to the base station and the mobile station. '724 patent, 2:43-58, 9:8-55, 19:8-36, 20:29-54, Fig. 23; Akl, ¶42. The inventors of the '724 patent further recognized that an efficient way to do this is to allocate such

base sequences by order of generally increasing to a maximum, and then decreasing from the maximum, the required cyclic shift amount for which the sequences are available. '724 patent, 9:8-55, Fig. 23; Akl, ¶42. The '724 patent implemented this approach by ordering the base sequences according to which sequences are available for a required cyclic shift amount. *Id.*

2. **"a plurality of sequences, which are indexed by the indices having consecutive numbers in order of generally increasing to a maximum value and then decreasing, from the maximum value, a required cyclic shift amount according to a sequence number"** (claims 12, 18)

IP Bridge's Construction	Defendants' Construction
"a plurality of sequences, which are indexed by the indices having consecutive numbers, such that the sequences are indexed in order of generally increasing required cyclic shift amount to a maximum value and then generally decreasing required cyclic shift amount from the maximum value"	Indefinite

IP Bridge's proposed construction provides helpful clarity and comports with the claim language, the specification, and the file history of the '724 patent. In contrast, Defendants assert incorrectly that the "plurality of sequences . . ." limitation is indefinite, ignoring critical evidence from the intrinsic record that shows otherwise.

(a) IP Bridge's Claim Construction is Correct in View of the Intrinsic Record

IP Bridge's construction is consistent with the claim language. As illustrated below, IP Bridge's construction clarifies that (a) it is the required cyclic shift amounts that are "increasing" and "decreasing" (blue highlighting), (b) the adverb "generally" applies to both "increasing" and "decreasing" (yellow highlighting), and (c) the sequences are indexed in the "increasing" and "decreasing" order according to the required cyclic shift amounts (gray highlighting):

"a plurality of sequences, which are indexed by the indices having consecutive numbers, such that the sequences are indexed in order of generally increasing required cyclic shift amount to a maximum

value and then generally decreasing required cyclic shift amount from the maximum value”

These clarifications are consistent with the “series modifier canon,” which “normally means that a modifier . . . applies to an entire series of parallel terms.” *Thomas v. Bryant*, 919 F.3d 298, 305 (5th Cir. 2019); *see also SIMO Holdings v. H.K. Ucloudlink Network Tech.*, 983 F.3d 1367, 1377 (Fed. Cir. 2021) (applying the “series modifier” canon in claim construction).

IP Bridge’s construction is also consistent with the specification of the ’724 patent.

Figure 23 (reproduced below) illustrates a series of indices (first column). Figure 23 further illustrates that it is the sequence number (r) (see second column highlighted in yellow) that is indexed, consistent with the clarification that the sequences are what are indexed. Akl, ¶47. In addition, Fig. 23 illustrates that the cyclic shift amount “ Δ ” (see fifth column highlighted in peach) both increases to a maximum value (e.g., from 1 to 18) and decreases from that maximum value (e.g., from 18 to 1), consistent with the first clarification that the required cyclic shift amounts are both increasing and decreasing. ’724 patent, 19:22-31; Akl, ¶47.

INDEX	SEQUENCE NUMBER (r)	u	POSITION (x) OF CORRELATION VALUE OCCURRING AT WRONG TIMING	MAXIMUM APPLICABLE CYCLIC SHIFT AMOUNT Δ VALUE	APPLICABLE CELL RADIUS
1	36	1	+/- 1	1	
2	18	2	+/- 2	2	
3	12	3	+/- 3	3	
4	9	4	+/- 4	4	
5	22	5	+/- 5	5	
6	6	6	+/- 6	6	
7	21	7	+/- 7	7	
8	23	8	+/- 8	8	
9	4	9	+/- 9	9	
10	11	10	+/- 10	10	
11	10	11	+/- 11	11	
12	3	12	+/- 12	12	
13	17	13	+/- 13	13	
14	29	14	+/- 14	14	
15	32	15	+/- 15	15	
16	30	16	+/- 16	16	
17	13	17	+/- 17	17	
18	2	18	+/- 18	18	
19	35	19	-/+ 18	18	
20	24	20	-/+ 17	17	
21	7	21	-/+ 16	16	
22	5	22	-/+ 15	15	
23	8	23	-/+ 14	14	
24	20	24	-/+ 13	13	
25	34	25	-/+ 12	12	
26	27	26	-/+ 11	11	
27	26	27	-/+ 10	10	
28	33	28	-/+ 9	9	
29	14	29	-/+ 8	8	
30	16	30	-/+ 7	7	
31	31	31	-/+ 6	6	
32	15	32	-/+ 5	5	
33	28	33	-/+ 4	4	
34	25	34	-/+ 3	3	
35	19	35	-/+ 2	2	
36	1	36	-/+ 1	1	

'724 patent, Fig. 23.

The patent specification also does not treat the “increasing” of cyclic shift amounts differently than the “decreasing” of cyclic shift amounts. Accordingly, a person of ordinary skill in the art would understand, consistent with the series modifier canon, that the modifier “generally” would apply equally to the “increasing” and “decreasing” required in claims 12 and 18, consistent with the clarification of IP Bridge’s construction that “generally” applies to both increasing cyclic shift amounts and decreasing cyclic shift amounts. '724 patent, 19:38-45; Akl,

¶47.

Nothing in the prosecution history of the '724 patent contradicts IP Bridge's construction. Akl, ¶48. The claims of the '724 patent were added during a preliminary amendment dated July 27, 2011, and subsequently allowed without rejection by the U.S. Patent and Trademark Office or remarks by Applicant. Ex. O, IPB213_0001178-1182, 1209-1220; Akl, ¶48.

Defendants do not propose an alternative construction, arguing through their expert instead that IP Bridge's construction "substantially redraft[s] the claim" by "distribut[ing]" the concepts of "generally" and "required cyclic shift" to "different parts of the claim without further defining the recited elements." Mahon, ¶84. Dr. Mahon provides no support for that conclusory assertion. Indeed, he does not actually identify any changes to the meaning of the claim through this "distribut[ing]." This is because IP Bridge's construction merely provides clarity consistent with the intrinsic record and English grammar. And while Dr. Mahon is correct in his alternative view that IP Bridge's construction "does not change the meaning of the claim," he is legally incorrect that this means the construction is "unnecessary." As the Federal Circuit has stated, the objective of claim construction is to "elaborat[e] the normally terse claim language[] in order to understand and explain but not to change the scope of the claim." *Embrex*, 216 F.3d at 1347 (citation omitted). This is exactly what IP Bridge's claim construction does, and the jury will be assisted by it.

Dr. Mahon also asserts incorrectly that IP Bridge's proposed construction improperly removes the language "according to a sequence number." Mahon, ¶83. As explained above, IP Bridge's proposed construction clarifies that "according to a sequence number" refers to the

sequences being indexed in order of required cyclic shifts, as reflected by the linking of the “sequences are indexed in order of . . . required cyclic shift amount.”³

(b) The Claim Term “a plurality of sequences . . .” is not indefinite

Defendants assert incorrectly that this limitation is indefinite because (a) “generally” is indefinite and (b) a “required cyclic shift” is indefinite.⁴ These arguments are inconsistent with the intrinsic record.

(i) A POSITA Would Understand the Scope of “Generally Increasing and . . . Decreasing”

Defendants assert that the term “generally” renders this limitation is indefinite. But the ’724 patent discloses what the term “generally” means in the context of the claims at issue and a POSITA could discern the scope of the claim with reasonable certainty. *See Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1370 (Fed. Cir. 2014) (“Claim language employing terms of degree has long been found definite where it provided enough certainty to one of skill in the art when read in the context of the invention.”).

A POSITA would understand from the ’724 patent specification that “generally increasing” refers to something that increases with possible periods of staying the same, but does not decrease. Akl, ¶54. Similarly, a person of ordinary skill in the art would understand from

³ To the extent that it would resolve a dispute, IP Bridge is amenable to the following clarification to its construction (underlined language added): “a plurality of sequences, which are indexed by the indices having consecutive numbers, such that the sequences are indexed according to a sequence number in order of generally increasing required cyclic shift amount to a maximum value and then generally decreasing required cyclic shift amount from the maximum value.” This proposed revision is consistent with the ’724 patent, which shows that the indexing of sequences is accomplished by sequence number. *See* ’724 patent, Fig. 23.

⁴ Defendants assert that two portions of the “plurality of sequences . . .” terms are indefinite: “the indices having consecutive numbers in order of generally increasing to a maximum value and then decreasing, from the maximum value” and “a required cyclic shift amount according to a sequence number.”

the '724 patent specification that “generally decreasing” refers to something that decreases with possible periods of staying the same, but does not increase. *Id.*

The '724 patent illustrates two embodiments that relate to the changing values of cyclic shift amounts. In a first embodiment associated with Figure 23, the cyclic shift amount increases strictly to a maximum value and then decreases strictly from that maximum value. '724 patent, 19:17-25; Akl, ¶54. In a second embodiment, associated with Figure 24, the cyclic shift amount increases or remains the same when moving towards the maximum value. '724 patent, 19:63-20:16; Akl, ¶54. A POSITA would understand that this departure from strictly increasing illustrates the “generally” increasing recited in the claim, and that “generally” decreasing would be understood with a similar meaning (i.e., the required cyclic shift amount decreases or stays the same, but does not increase when it is “generally” decreasing). Akl, ¶54.

Defendants’ expert, Dr. Mahon, asserts that the '724 specification does not state how far a person of ordinary skill may depart from “strict increasing” and still be “generally increasing.” Mahon, ¶68. But Dr. Mahon ignores Figure 24 of the '724 patent, the very disclosure that provides guidance as to the meaning of “generally” in the patent. Because Dr. Mahon’s argument that “generally” increasing and decreasing is indefinite did not consider the relevant intrinsic evidence, his analysis is unreliable. *See Phillips*, 415 F.3d at 1318.

(ii) A POSITA Would Understand the Scope of “Required Cyclic Shift Amount”

A POSITA would understand the scope of the term “required cyclic shift” in the context of the '724 patent specification to refer to a cyclic shift amount required by a base station. Akl, ¶¶50-52.

The '724 patent specification teaches that the “required cyclic shift amount Δ is set so as to be greater than” delays in “the relevant cell.” '724 patent, 19:26-43; Akl, ¶51. The '724

patent further illustrates in Fig. 23 how the required cyclic shift changes, depending on the cell size. *Id.* More specifically, the '724 patent explains that the cyclic shift amounts Δ are “arranged in an order proportional to the cell radius.” '724 patent, 19:38-45. The '724 patent further explains that, because each individual sequence has a maximum cyclic shift for which it is available, the sequences can be organized by their availability for the required cyclic shifts. '724 patent, 19:17-24, 46-61; Akl, ¶51. A person of ordinary skill in the art would thus understand that the claimed “required cyclic shift amount” is a cyclic shift amount that is required by a base station. *See* § II.D.1, *supra*.

Defendants’ expert Dr. Mahon claims that “required cyclic shift amount” is not a term of art, and that, therefore, a person of ordinary skill in the art would not be able to reasonably ascertain the meaning of this term. Mahon, ¶¶75-76. There can be no reasonable dispute, however, that “required” and “amount” are everyday words requiring no special construction. And the background discussion of the '724 patent cites a document for its disclosure of “cyclic shift,” confirming that this term was well known in the art. '724 patent, 1:38-47; 2:32-33 (citing to “3GPP TSG RAN: Physical Channels and Modulation (Release 8),” TS36.211 V1.0.0 for the known use of “cyclic shift”); Ex. P, p.26 (explaining that “random access preambles with zero correlation zone are defined by cyclic shifts...”). Additionally, the '724 patent specification, as explained above, uses this phrase consistent with its plain meaning (i.e., an amount of a cyclic shift that is required in a cell). '724 patent, 19:26-37, 20:49-56. Thus, “required cyclic shift amount” does not require construction. *See Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1372 (Fed. Cir. 2003) (“[S]imply because a phrase as a whole lacks a common meaning does not compel a court to abandon its quest for a common meaning and disregard the established meanings of the individual words.”).

Defendants' expert also asserts incorrectly that there is no disclosure of a "required cyclic shift amount according to a sequence number." Mahon, ¶76. In particular, Dr. Mahon contends that the claims require that the "required cyclic shift amount" be determined "according to a sequence number." *Id.* This assertion is based on an improper reading of the claim language. As explained above, the language "according to a sequence number" refers to how the sequences are indexed, along with their required cyclic shifts. Akl, ¶52. For example, Figure 23 illustrates "correspondence relationships between sequence numbers and indexes" according to an embodiment of the invention. '724 patent, 4:15-17. As noted above, to the extent it would be helpful to the jury, IP Bridge is amenable to a construction that further clarifies that the sequences are indexed according to their sequence number. *See n. 3, supra.*

3. "the required cyclic shift amount is a required cyclic shift amount for a mobile station moving at high speed" (claim 13)

IP Bridge's Construction	Defendants' Construction
Plain and ordinary meaning	Indefinite

Defendants assert incorrectly that this term is indefinite because the term "required cyclic shift amount" is indefinite. Mahon, ¶75. For the reasons explained in the previous section, a POSITA would have understood the meaning of a "required cyclic shift amount" and, thus, this term is not indefinite. *See Section II.D.2.b, supra.*

E. U.S. Patent No. 8,385,239

1. Background

The '239 patent is generally directed to a method and system for efficiently instructing a user device to transmit a channel quality indicator report that is either multiplexed with data or not multiplexed with data. The '239 patent enables the signaling of multiplexed or non-

multiplexed channel quality indicator reports using the existing signaling framework of the 4G LTE technical standard, without additional signaling overhead.

2. “the aperiodic channel quality indicator report is multiplexed with data transmitted by the mobile terminal”/ “the aperiodic channel quality indicator report is not multiplexed with data transmitted by the mobile terminal” (claim 14)

IP Bridge’s Construction	Defendants’ Construction
“the aperiodic channel quality indicator report is multiplexed with user data transmitted by the mobile terminal” / “the aperiodic channel quality indicator report is not multiplexed with user data transmitted by the mobile terminal”	Plain and ordinary meaning of the term “with data”

The ’239 patent specification imposes the requirement that, in “the present invention,” the data multiplexed or not multiplexed with a channel quality indicator is “user data.” The sole dispute is whether the term “data” in the multiplexing limitations should honor that description of “the present invention,” as IP Bridge proposes, or whether that description of “the present invention” should be disregarded, as Defendants propose. As explained below, IP Bridge’s construction is consistent with the prior claim construction performed by the District of Delaware when it considered this exact same issue and arguments, based on the very same intrinsic evidence.

The District of Delaware was asked to resolve the following issue: Does “data” refer to “user data” when used in the context of multiplexing or not multiplexing the channel quality indicator report with data in the ’239 patent? The Delaware court concluded that the ’239 patent discloses that “data” refers to “user data” in this context. *Godo Kaisha IP Bridge I v. TCL Commc’n Tech. Holdings Ltd.*, 249 F. Supp. 3d 767, 780 (D. Del. 2017). TCL did not appeal this construction.

The Delaware court correctly found that “data” in the claim refers to “user data,” since that is how the ’239 patent describes its invention. The ’239 patent explicitly describes “the present invention” as addressing multiplexing or not multiplexing CQI with “user data.” For example, the ’239 patent explains that “the present invention” is “an aperiodic reporting of CQI that is not multiplexed with **user data** even if the buffer is not empty, which will be further referred to as ‘CQI only mode.’” ’239 patent, 13:65-14:5. The abstract also states that “[t]he **invention** suggests . . . generating a control channel signal comprising a transport format and a channel quality indicator trigger signal . . . said transport format is a predetermined format for **user data** transmission.” ’239 patent, abstract. Because the ’239 patent specification imposes the requirement that the data multiplexed or not multiplexed with a channel quality indicator is “user data” in “the present invention,” and not just an embodiment, IP Bridge’s construction correctly limits “data” to “user data.” *Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1308 (Fed. Cir. 2007) (“When a patent thus describes the features of the ‘present invention’ as a whole, this description limits the scope of the invention.”); *see also Regents of the Univ. of Minn. v. AGA Med. Corp.*, 717 F.3d 929, 936 (Fed. Cir. 2013); *Honeywell Int'l, Inc. v. ITT Indus., Inc.*, 452 F.3d 1312, 1316-19 (Fed. Cir. 2006).

Consistent with how the ’239 patent describes the invention, the patent repeatedly describes the relevant “data” as “user data” throughout the patent. For example, the ’239 patent specification explains that the “CQI trigger as well as the transport format parameter in their usual meaning” “may be a multiplexing of CQI with **user data** in an uplink transmission.” ’239 patent, 14:30-37. Moreover, the ’239 patent explains that under a “preferred embodiment of the invention” the “predetermined mode for reporting the channel quality indicator” (i.e., CQI only mode) is where “aperiodic channel quality indicator is to be transmitted . . . without multiplexing

with user data.” ’239 patent, 10:56-61; *see also* 9:51-54, 13:65-14:5, 14:15-56; *Astrazeneca AB v. Mut. Pharm. Co.*, 384 F.3d 1333, 1339 (Fed. Cir. 2004) (finding that “the patentee’s choice of preferred embodiments can shed light on the intended scope of the claims”).

Defendants’ expert, Mr. Lanning, ignores the Delaware claim construction, as well as the repeated description of the relevant data as “user data” in “the present invention.” Instead, Mr. Lanning asserts that “data” is not limited to “user data” because the ’239 patent discloses other alleged types of data, such as control information, that could be transmitted in a wireless communication system. Lanning, ¶46. But the information he points to is never referred to as “data” in the ’239 patent, and, more importantly, is never described as being multiplexed or not multiplexed with CQI, as the claims require. For example, Dr. Lanning points to control information such as hybrid ARQ information, UE Identity information, power control information, MIMO related information, ACK/NACK, precoding matrix indicators and rank indicators that he asserts “could be reported using the PUSCH,” the channel used to carry CQI reports.” *Id.* But, this control information is never called “data” in the ’239 patent, and, unlike the many statements in the ’239 patent that CQI is not multiplexed with “user data,” the patent does not disclose that the CQI information is not multiplexed with these other types of control information.

Mr. Lanning also takes disclosures of the ’239 patent out of context in attempting to support his argument. In particular, he relies on the following language in the ’239 patent:

a control signalling scheme, which allows to request a terminal to transmit an aperiodic CQI report to a base station, wherein the report only contains CQI information, i.e., without multiplexing the CQI information with Uplink Shared Channel data, even in case the data buffer at the terminal is non-empty.

Lanning, ¶47 citing ’239 patent, 9:30-35. Mr. Lanning asserts that, because the patent refers to “Uplink Shared Channel data,” which he asserts (without support) transmits “user data, CQI

data, and other control data,” the “data” in the data buffer is not user data. Lanning, ¶47. But Mr. Lanning ignores the preceding discussion in the ’239 patent, which makes clear that, in those prior systems that the ’239 patent sought to improve upon, it was “user data” (rather than control information) that was stored within the data buffer and multiplexed with CQI on the Uplink Shared Channel: “[T]he Physical Uplink Shared Channel (PUSCH) may be used to transmit an aperiodic CQI report Usually, in case a data buffer at the UE is non-empty, *user data* and CQI are multiplexed with each other.” ’239 patent, 8:39-44. Mr. Lanning also ignores the express statement in the ’239 patent that, in the context of multiplexing with data, the “ordinary meaning” refers to “user data.” ’239 patent, 14:30-37. When viewed in context, it is indisputable that the purpose of the ’239 patent’s invention, as described by this passage, is that CQI need not be multiplexed with user data, even if there is user data in the data buffer.

F. U.S. Patent No. 9,137,000

1. Background

The ’000 patent is generally directed to a CQI transmission scheme that reduces the amount of CQI information calculated by the mobile terminal, transmitted from the mobile terminal to the base station, and used by the base station for optimal Modulation and Coding Scheme (MCS). For example, instead of the conventional approach of a base station transmitting control information requesting that the mobile terminal send a separate CQI for *each* individual subcarrier, the ’000 patent discloses requesting separate CQI for *blocks* of subcarriers, or a single CQI for the entire bandwidth. *See, e.g.*, ’000 patent, 7:25-41, 11:18-34.

2. “subcarrier block” (claims 1, 11)

IP Bridge’s Construction	Defendants’ Construction
Plain and ordinary meaning	“unit of resource allocation comprising consecutive subcarriers collected together”

The term “subcarrier block” would have been understood by a POSITA to be a “block of subcarriers.” Because the patent provides no lexicography and there is no clear and unambiguous disavowal of claim scope, this term does not need construction. *Thorner*, 669 F.3d at 1365.

There is no dispute that the constituent words—“subcarrier” and “block”—are well understood. While Dr. Mahon asserts that the full term “subcarrier block” was not a term of art (Mahon, ¶99), this does not mean that it is proper to ignore the common meaning of the individual words. *Altiris*, 318 F.3d at 1372; *see also Bancorp Servs., L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1372 (Fed. Cir. 2004) (“[T]he components of the term have well-recognized meanings, which allow the reader to infer the meaning of the entire phrase with reasonable confidence.”).

Defendants’ only argument that a construction for “subcarrier block” is necessary is based on isolated language in the ’000 patent describing examples of how subcarrier blocks *can* be used, not language that is lexicographical or that disavows claim scope. In particular, Defendants rely on the following two statements:

- “*Typically, subcarrier blocks are adopted where a plurality of consecutive subcarriers* where correlation of fading fluctuation is high are collected together, with frequency scheduling and adaptive modulation then taking place in subcarrier block units.” ’000 patent, 8:58-62.
- “A description is given for wireless communication apparatus 100 and communication terminal apparatus 200 where a subcarrier is taken as a unit of allocation but it is also *possible to adopt subcarrier blocks* or resource blocks where pluralities of subcarriers are collected together.” *Id.*, 8:41-44

But “typically” using subcarrier blocks in a certain way, or describing that such use is “possible,” in no ways defines the term “subcarrier block,” or disavows claims scope. *See Epos Techs. Ltd. v. Pegasus Techs. Ltd.*, 766 F.3d 1338, 1344 (Fed. Cir. 2014) (holding that the district court erred in construing the claims to require an element that was described in the specification

only as “preferably” or “typically” used); *see also Blackbird Tech LLC v. ELB Elecs., Inc.*, 895 F.3d 1374, 1378 (Fed. Cir. 2018) (holding that the specification’s statement that a fastener was used in “typical operation” did not limit the claims).

Since a POSITA would have understood the plain and ordinary meaning of “subcarrier block,” and Defendants do not identify any lexicography or disavowal, the plain and ordinary meaning applies.

III. CONCLUSION

For the foregoing reasons, IP Bridge respectfully requests that the Court adopt its proposed constructions and reject those proposed by Defendants.

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CERTIFICATE OF SERVICE

The undersigned attorney hereby certifies that the foregoing document was filed electronically in compliance with Local Rule CV-5(a). Pursuant to Local Rule CV-5(c), all counsel of record were served a true and correct copy of the foregoing document by electronic mail on this February 15, 2022.

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